Relationship between body composition, sprint performance and vertical jump tests in young elite soccer players

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Introduction

Elite soccer requires high level competencies across many specific physical qualities. Being able to ensure players' progress at the required levels in order to achieve elite status is of paramount importance to scientists and practitioners working within elite youth levels. We analyzed anthropometric and sports performance data of young elite soccer players at two different times over a competitive season and investigates the relationship between body composition and physical tests of vertical jump and sprint.

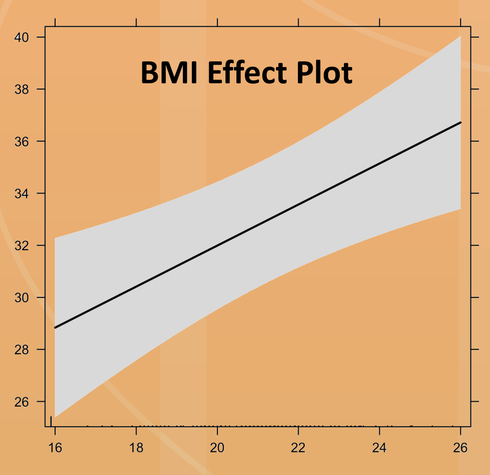
Methods & Materials

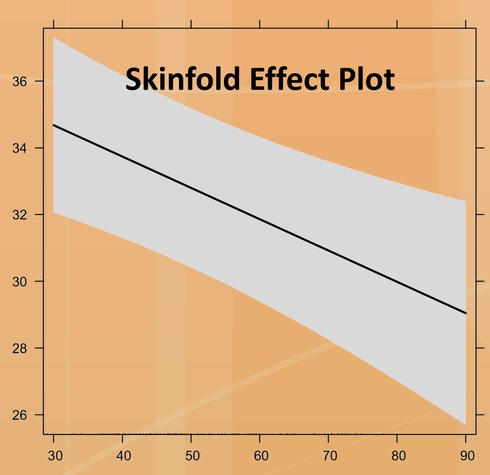
Anthropometric measurements (body weight, height and sum of eight skinfolds), squat jump (SJ), countermovement jump (CMJ) and sprint tests (V5 and V20) were evaluated at two different times over a competitive season. To analyze the results we used anova function provided by the statistical computing program R where was performed a linear mixed models to assay the effect of height, Body Mass Index (BMI) and total value of the skinfolds on the performance of athletes in each test. All procedures were approved by an ethical committee, and fully supported by the professional soccer club's sport science and medical departments.

Results

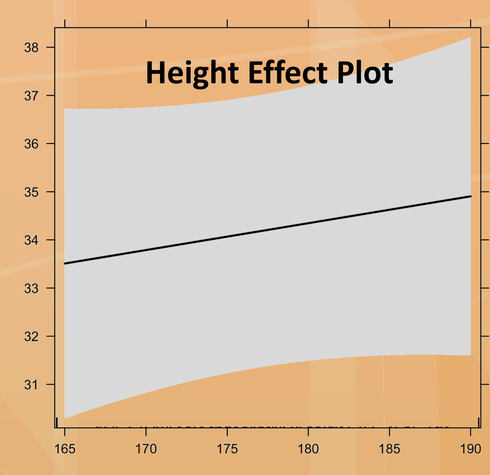
88 male athletes with mean age of 15,53 ± 1,45 years were included in this study and significant relationships were observed between the results of physical tests of vertical jump and sprint speed and sum of skinfolds (SSF) and BMI. SSF positively correlated in SJ test ($F=9.96$, $p<0.002$), CMJ ($F=11.29$, $p<0.001$), V5 ($F=5.94$, $p<0.016$) and V20 ($F=33.41$, $p<4.327e-08$). Such as SSF, BMI positively correlated in SJ test ($F=9.68$, $p<0.002$), CMJ ($F=5.58$, $p<0.019$) and V20 ($F=22.58$, $p<6.731e-06$). If we use a significance value $p<0.10$ the BMI influences not only the running times in V20 but also in V5. We can also verify that the older athletes were the ones that presented better results in all the tests.

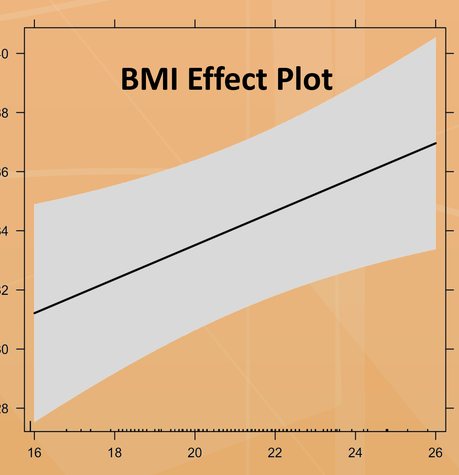
Squat Jump

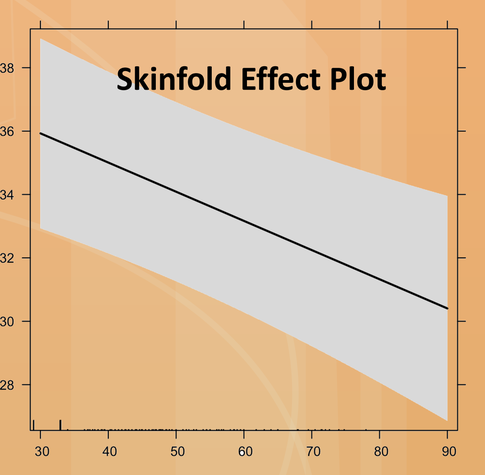




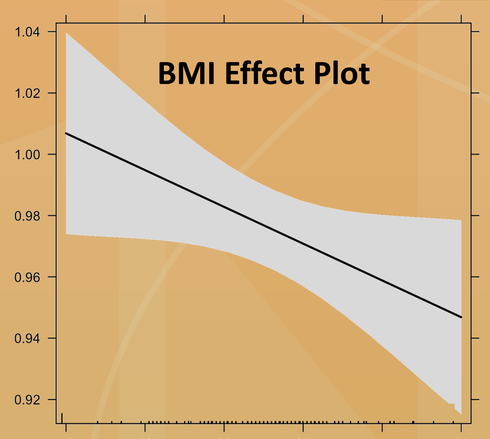
Countermovement *Jump*

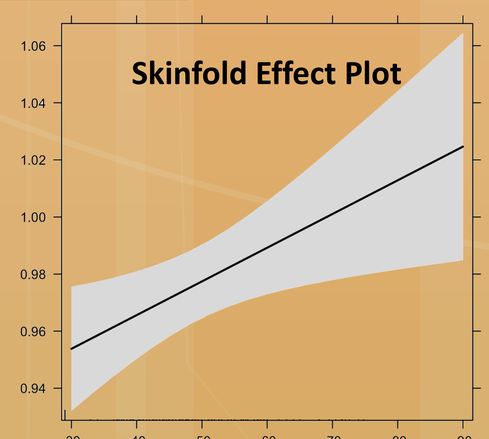




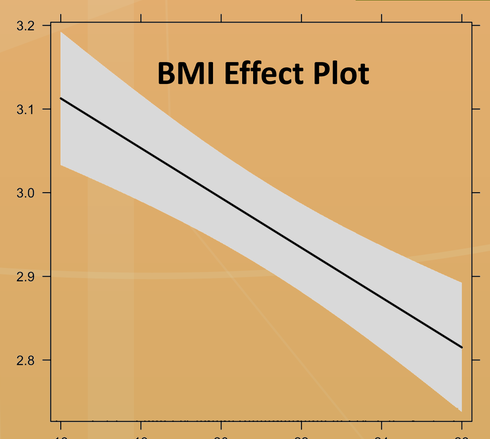


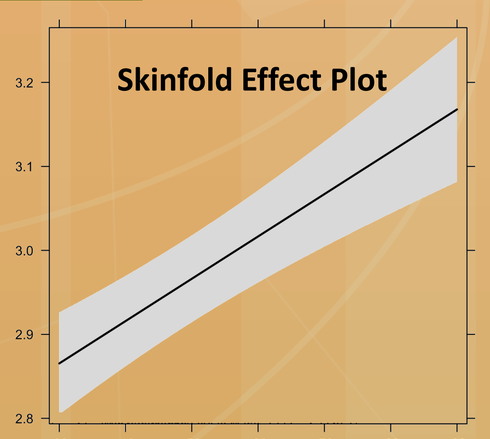
Sprint test – 5m





Sprint test – 20m





Discussion & Conclusion

With the relationships observed, it is clear the importance of a body optimization for better sports income. In a game as demanding as football, where there are constant jumps and sprints, it is essential that athletes have an amount of muscle mass within the recommended values so that their performance is not affected during the exercise (1). An unbalanced body composition, with a high amount of fat mass, represents a greater wear in the motor actions, negatively influencing the athlete's activity (2). In order for the body composition to be ideal, the role of the Nutritionist is crucial in order to guide and provide the athletes with the necessary bases for a balanced and autonomous diet so that they can optimize their performance and thus achieve excellent performances.

References

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